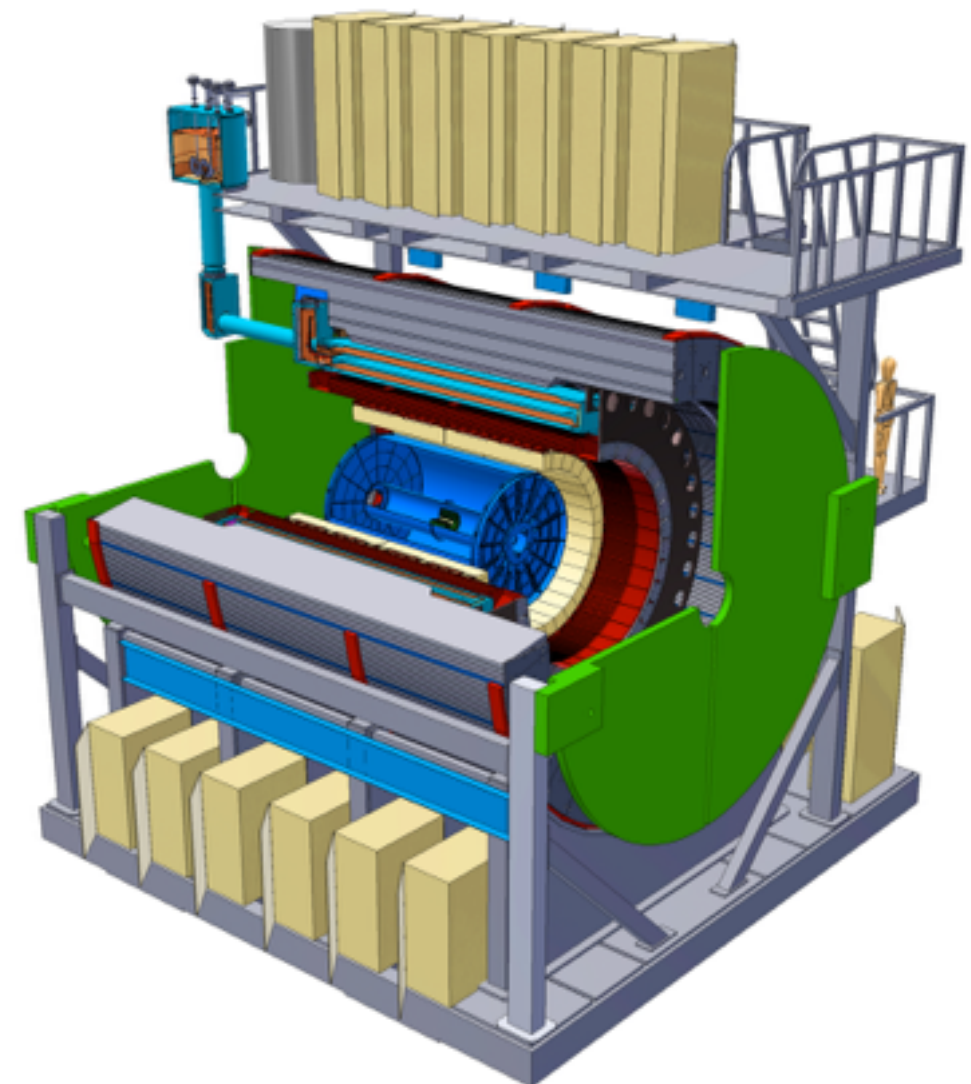


# Context within broader jet studies in sPHENIX

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for the Jet Structure Topical Group

MAPS MIE proposal and HF-  
jet Topical Group Workfest  
*5-7 January 2017*  
*Santa Fe, NM*



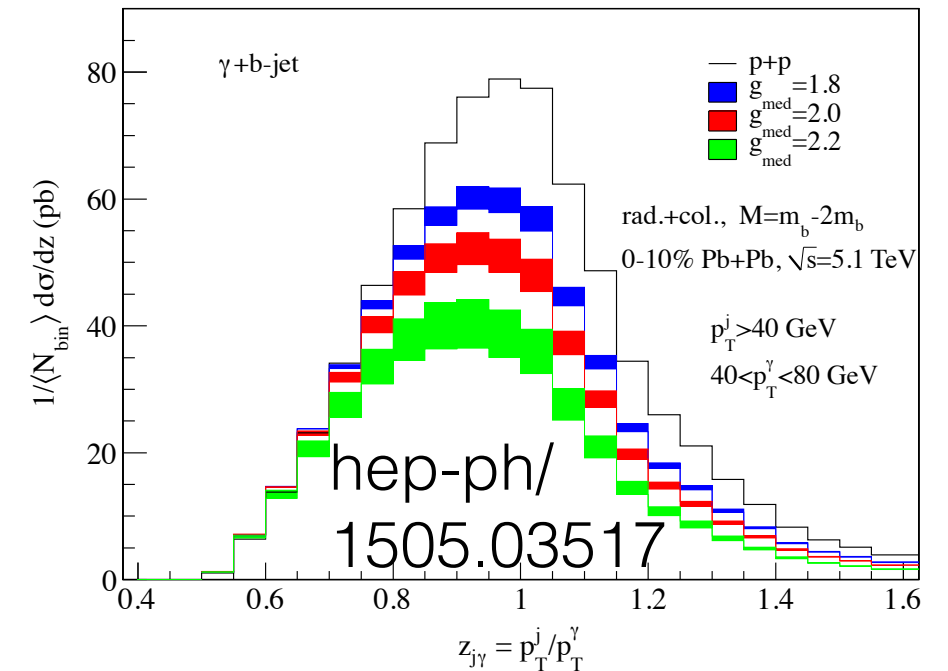
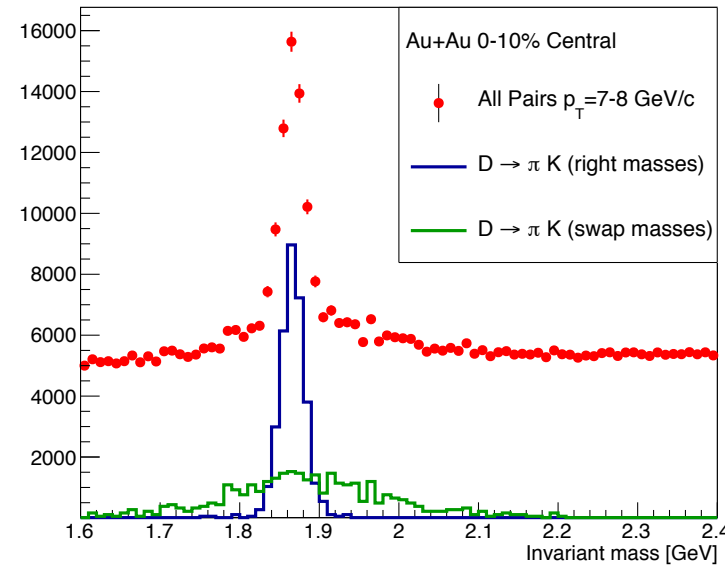
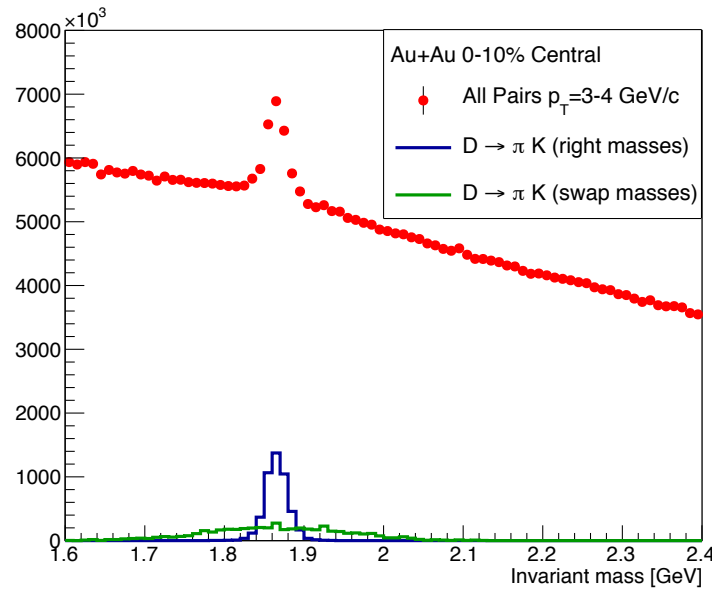
# Role of JS Topical Group

- Performance:
  - ➔ quantify sPHENIX experimental capabilities
  - ➔ provide guidance to Collaboration for design decisions / reviews
- Physics:
  - ➔ keep abreast of scientific developments
  - ➔ determine where our physics program can be most impactful
- Simulations/software:
  - ➔ keep up with / test latest updates in the simulations framework
  - ➔ develop tools for eventual analyzers
- Organizational/support:
  - ➔ provide plots/input for sPHENIX talks/posters/proceedings/reviews

# Some HF-JS overlaps: performance

- Measurement of jet properties
  - ➔  $E$ -scale/resolution, for all truth-tagged  $b$ -jets and for ones passing experimental  $b$ -identification
    - ➔ interaction with Particle Flow-style jet reco?
  - ➔ may want to explore mass /  $z_g$  / grooming / etc. performance separately
    - ➔ but difficult to imagine statistics for very differential substructure measurements for full HF-tagged jets
- Selection of hard-scattering jets
  - ➔ purity for real jets among set of all jets with a  $b$ -tag
  - ➔ efficiency for  $b$ -tagged jets for various “fake jet rejection” schemes

# Some HF-JS overlaps: physics



- Fragmentation functions for HF hadrons
  - ➔ like early MIE proposal studies (*left*), but with reduced combinatoric background by requiring hadrons in jets
- Photon-HF hadron correlations
  - ➔ physics advantage of e.g. photon+ $b$ -jet (*right*), but better statistics and no jet performance required
- Statistical projections
  - ➔ update expected yields of inclusive/ $c$ / $b$ -jet for projected Au+Au,  $p$ +Au, and  $p+p$  luminosities & tagging efficiency \* BF

# Some HF-JS overlaps: tools

- Consistent truth-level tagging
  - ➔ tool developed within software framework for jet parton-flavor tagging at the generator level
  - ➔ being integrated into Jet Structure work, possibly with extensions (initial-state flavor, HF process info)?
- Harmonization of simulation efforts
  - ➔ consistency of tracker description & reco settings always important
  - ➔ common set of background Hijing hits files for QM-timescale simulation results: `/sphenix/sim/sim01/production/sHijing/2016-12-21/fm_0-4/`
- Development of “standardized” set of analysis tools
  - ➔ HF group is leading the way w/ *b*-tagging tools in git
  - ➔ a major goal within the JS group is to follow suit on, e.g. high-level photon objects, fake jet rejection, PFlow reco, etc.